Paper No. 40

UNITED STATES PATENT AND TRADEMARK OFFICE
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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES
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<u>Ex parte</u> JEAN-PAUL BILLON
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Appeal No. 2000-0168
Application No. 08/934,393
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HEARD: January 23, 2002
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Before JERRY SMITH, LALL, and BLANKENSHIP, <u>Administrative Patent Judges</u>

LALL, <u>Administrative Patent Judge</u>.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 15 through 17, 22, 23, 27, 30 through 38, 41 through 43, and 45 through 53, all the pending claims in the application.

The disclosed invention relates to modeling of industrial processes using an algorithm that is sufficiently concrete to be

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executed in a computer programming language of choice for

application to various specific end users within specific

fields of endeavor for use by professionals within those

fields. A given set of events, items and actions pertinent to

those fields are symbolically represented in an algorithm used

to program a computer. A computer responsive to the algorithm

provides a logical analysis of those symbolically represented

events, items and actions to produce a result expressed as a

logical computation usable by the professional to control

industrial systems within those fields of endeavor, which is a

useful, concrete, and tangible result. Logical elements are

arranged as mathematical "statements" which describe very

specific inter-relationships among the elements, i.e., both

the real-world problems of industrial systems and specific

real-world relationships are symbolically represented as

mathematical statements to represent real world problems and

how they actually inter-relate, so that computer predictions

of the outcome of those inter-relations can be made. A

further understanding of the invention can be achieved by the

reading of claim 27, a copy of which is attached to this

decision.

Claims 15 through 17, 22, 23, 27, 30 through 38, 41 through 43, and 45 through 53 stand rejected under 35 U.S.C. § 101 as being directed to a non-statutory matter. There is no art rejection in the case.

Rather than repeat the arguments of appellant and the examiner, we make reference to the briefs[1] and the answer for the respective details thereof.

<div align="center">OPINION</div>

We have considered the rejection advanced by the examiner and the supporting arguments. We have, likewise, reviewed the appellant's arguments set forth in the briefs.

We reverse.

In response to the final rejection (paper no. 23) which in turn references the previous rejection (paper no. 19), appellant argues with respect to claims 15 through 17, 22, 23,

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[1]A reply brief (paper no. 34) and a supplemental reply brief (paper no. 35) were filed on July 12, 1999, and July 23, 1999 respectively. The entry of both of these documents was noted by the examiner (paper no. 36) without any further response.

27, 37, 38, 41 through 43, and 45 through 53 (brief at page

12, *et seq*.) that the examiner's analysis fails to consider

the claims as a whole and that the examiner misunderstands the

definition of

"industrial system". Appellant continues, brief at page 13,

that: "the rejection, [sic] erroneously relies on the now

reversed State Street Bank . . . " Appellant further argues,

Id. at page 14, that: "[t]he examiner looks only to the

operation of the algorithm and fails to look to the entire

process claims." The examiner responds, answer at page 4,

that: "[t]he application contains no disclosure relating to

means of implementing any of the end uses recited in claims

. . . . The claims are essentially directed to the method of

calculating numbers to determine the unsatisfiability of input

terms in a mathematical algorithm." The examiner further

responds, Id., that: "[i]n State Street Bank, the U.S. Court

of Appeals for the Federal Circuit ruled that the claims

involved produced 'a useful, concrete and tangible result'."

Appellant argues, reply brief at page 3, that:

> The claims at issue relate to a test computer
> program utilizing high level mathematics for
> verifying an operation or defect to be able to
> control the development of an industrial system
> (described in terms of numerous fields of
> technology, science and medicine, where those
> numerous fields are symbolically represented within
> the mathematics) by virtue of test results obtained.
> A calculated result is used for decision making in
> the control process. Such clearly provides a useful,
> concrete and tangible result.

We agree with the appellant's position. The claims in each instance recite a useful, concrete and tangible result. For instance, see claim 27, steps 5 and 6. Therefore, we do not sustain the rejection of claims 15 through 17, 22, 23, 27, 37, 38, 41 through 43, and 45 through 53 under 35 U.S.C. § 101.

With respect to claims 30 through 36, final rejection, paper no. 23, appellant argues, brief at page 17, that: "[c]laims 30-36 define the invention as an information carrier including a computer-readable <u>medium</u> having a program stored therein." In response, the examiner states, answer at page 5, that: "MPEP Section 2106 . . . states that 'when a computer program is recited in conjunction with a physical structure,

such as a computer memory, Office Personnel should treat the

claim as a product claim . . . .'" We do not agree with the

examiner's position. Rather, we are persuaded by appellant

that these claims indeed are directed to a computer-readable

medium having a program stored therein. Since we have decided

above, that the computer program as claimed does belong to a

statutory process under 35 U.S.C. § 101, we conclude that

these claims also belong

to the statutory category under 35 U.S.C. § 101. Therefore,
we
reverse the examiner's rejection of claims 30 through 36.

The decision of the examiner rejecting claims 15 through

17, 22, 23, 27, 30 through 38, 41 through 43, and 45 through

53 under 35 U.S.C. § 101 is reversed.

<u>REVERSED</u>

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JERRY SMITH   )
Administrative Patent Judge   )
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)   BOARD OF PATENT
PARSHOTAM S. LALL   )   APPEALS AND
Administrative Patent Judge   )   INTERFERENCES
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HOWARD B. BLANKENSHIP   )
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Appeal No. 2000-0168
Application No. 08/934,393

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APPENDIX
Claim 27

27.   A computer-implemented method of automated proving for unrestricted first-order logic to test the unsatisfiability of a set of input terms ($\mathbf{Q}$) representative of clauses or superclauses, the set of input terms describing an industrial system, the method comprising the steps of:

(1) mapping in a computer each of the input terms ($\mathbf{Q}$) onto an equivalent generalized term defined as a triplet <$\mathbf{Q}$,, ,$\mathbf{i}$>, where , is an empty substitution and $\mathbf{i}$ is an empty set, to form a set ($\mathbf{E}$)of generalized terms;

(2) applying, in the computer, to the set ($\mathbf{E}$) an instance extraction rule (IE) defined as follows:

(IE) $\mathbf{E}$ 6 ($\mathbf{E}$ -{$\mathbf{Q}$<$\mathbf{F}$,$\mathbf{7}$>})C($\mathbf{Q}$<$\mathbf{FF}$,$\mathbf{7}$*$\mathbf{FF}$>,$\mathbf{Q}$<$\mathbf{F}$,$\mathbf{7}$C{$\mathbf{FF}$}>) where $\mathbf{F}$ is a substitution, $\mathbf{7}$ is a finite set of standard substitutions {$\mathbf{7}_1$,..., $\mathbf{7}_<$}, the doublet <$\mathbf{F}$, $\mathbf{7}$> is a generalized substitution which maps a standard term onto a generalized term defined as a triplet <$\mathbf{Q}$,$\mathbf{F}$,$\mathbf{7}$> such that <$\mathbf{Q}$,$\mathbf{F}$,$\mathbf{7}$> = <$\mathbf{Q}$,$\mathbf{F}$,$\mathbf{7}$>, F is a substitution valid for the generalized term <$\mathbf{Q}$,$\mathbf{F}$,$\mathbf{7}$> and $\mathbf{QF}$ is an instance of $\mathbf{Q}$ yielded by the substitution $\mathbf{F}$ and is a standard term equivalent to the generalized term <$\mathbf{Q}$,$\mathbf{F}$,$\mathbf{i}$> the instance extraction rule (IE) resulting from an instance generation rule (IG) and an instance subtraction rule (IS), the instance generation rule being defined as:

$$\text{(IG)} \qquad \frac{\mathbf{Q}<\mathbf{F},\mathbf{7}>}{\mathbf{Q}<\mathbf{FF},\mathbf{7}*\mathbf{FF}>}$$

and the instance subtraction rule being defined as:

(IS) $\mathbf{Q}$ <$\mathbf{F}$,$\mathbf{7}$> 6 $\mathbf{Q}$ <$\mathbf{F}$,$\mathbf{7}$c$\{\mathbf{FF}\}$>

meaning that the triplet $\mathbf{Q}$ <$\mathbf{F}$, $\mathbf{7}$> should be replaced with $\mathbf{Q}$ <$\mathbf{F}$,$\mathbf{7}$c$\{\mathbf{FF}\}$>, the step (2) resulting in a current set ($\mathbf{E}$);

(3) generating, in the computer, a ground instance GIG($\mathbf{E}$) of the current set $\mathbf{E}$, the ground instance generation GIG being a ground substitution replacing every variable with a same fixed constant and defined by the rule:

(GIG) $\dfrac{\mathbf{Q}}{\mathbf{Q}_{gr}}$

where $\mathbf{Q}_{gr}$ is a ground instance of term $\mathbf{Q}$, the ground instance $\mathbf{Q}_{gr}$ being obtained by replacing every variable with a same fixed constant;

(4) applying and repeating steps (2) and (3) in the computer until the ground instance GIG($\mathbf{E}$) of the current set ($\mathbf{E}$) is unsatisfiable;

(5) determining, in the computer, the unsatisfiability of the set of input terms when the ground instance GIG($\mathbf{E}$) is unsatisfiable; and

(6) controlling development of the industrial system using information on the unsatisfiability of the input terms.